**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**SCIENCE AND ECOSYSTEM SUPPORT DIVISION**
**OFFICE OF QUALITY ASSURANCE**
**REGION IV**
**980 COLLEGE STATION RD.**
**ATHENS, GA 30605-2720**

**MEMORANDUM**

DATE: October 4, 2001

SUBJECT: Transmittal of Review of Asbestos data for Palmetto Vermiculite, Project 01-0812. These results were submitted by EMSL Analytical, Inc., New Jersey and reviewed by Integrated Laboratory Systems, Athens, Georgia.

FROM: Denise L. Goddard
Chemist
Office of Quality Assurance

TO: Kevin Simmons, Project Leader
Environmental Investigations Branch

Attached is the complete Technical Data Review package for the above projects.

If you have any questions or concerns please contact me at (706) 355-8568.

Attachment

September 18, 2001

# INORGANIC DATA QUALIFIERS REPORT

**Case:** Palmetto Vermiculite
**Project Number:** 01-0812
**Site:** Palmetto Vermiculite, Woodruff, SC

| Sample No. | Element | Flag | Reason |
|---|---|---|---|
| 7460 | No data qualifiers applied | | |
| 7461 | No data qualifiers applied | | |
| 7462 | No data qualifiers applied | | |
| 7463 | No data qualifiers applied | | |
| 7464 | No data qualifiers applied | | |

September 14, 2001

Ms Denise Goddard
United States Environmental Protection Agency
Science and Ecosystem Division
980 College Station Road
Athens, GA 30605-2720

Subject: Data Review and Validation
Case Palmetto Vermiculite, Project No. 01-0812
R4LIMS Nos. 740 - 7464
Inorganic Analysis: EMSL Analytical, Inc., Westmont, NJ
Date Received from Lab:09/05/01
EWAD No. 04-0101-05
TDF No. 00-0939

Dear Ms Goddard:

The ESAT Work Team has reviewed the above-captioned SPR case consisting of a non CLP data package for five soil samples for asbestos analysis according to EPA guidelines. This package presents acceptable contractual and technical performance with qualifications. Further details are provided below and in the attached review summary form.

**Asbestos Analysis**

Examination of blank samples revealed no apparent contamination with asbestos.

No deviation from the methods listed in the Quality Assurance Project plan were observed, and no Quality Assurance/Quality control problems were observed. No data qualifiers were applied.

Further details are provided in the attached review summary form. Please feel free to contact this office if we can be of further service.

Very truly yours,

James H. Chandler III
Sr. Inorganic Data Reviewer
ManTech Environmental Technology, Inc.

Approved:

Doug Winters
Region IV ESAT Team Manager
Integrated Laboratory Systems

Data Qualifiers Summary

| Element | Flag | Samples Affected | Reason |
|---|---|---|---|

No Data Qualifiers were applied

August 8, 2001



Jim Gray
US EPA
College Station Rd
Athens, GA 30613-7799

RE: EMSL Order ID# 040109201

Dear Jim:

Attached please find the results of your soil samples from the above referenced order number. These samples were analyzed for asbestos content via PLM NIOSH 9002 (Issue 2) and for asbestos structure quantification via the Draft Modified Elutriator Method for the Determination of Asbestos in Soils and Bulk Material Method (EPA-540-R97-028 EPA Superfund). This letter is meant to document all the structure quantities identified by the Elutriator method including those not counted/reported based on the method's requirements. A summary of the results are given in the table below, explanatory notes follow. All results are from the reading of 10 grid openings for each analyzed sample.

| Customer Sample ID/ EMSL Sample ID | Total Asbestos Structures[2] | Reported Asbestos Structures[3] | | Excluded Asbestos Structures[6] | Mineral Fibers of Concern[7] |
|---|---|---|---|---|---|
| | | Protocol[4] | Long[5] | | |
| PV-004-VO/040109201-0001 | NOT REPORTED[1] | N/A | N/A | N/A | N/A |
| PV-005-VO/040109201-0002 | NOT REPORTED[1] | N/A | N/A | N/A | N/A |
| PV-006-VO/040109201-0003 | 0 | 0 | 0 | 0 | 3 |
| PV-007-VO/040109201-0004 | NOT REPORTED[1] | N/A | N/A | N/A | N/A |
| PV-123-VO/040109201-0005 | 0 | 0 | 0 | 0 | 1 |
| CV-001-VO/040109201-0006 | 0 | 0 | 0 | 0 | 3 |
| CV-002-VO/040109201-0007 | 0 | 0 | 0 | 0 | 0 |
| CV-003-VO/040109201-0008 | 0 | 0 | 0 | 0 | 0 |
| CV-004-VO/040109201-0009 | 0 | 0 | 0 | 0 | 0 |
| CV-005-VO/040109201-0010 | 0 | 0 | 0 | 0 | 5 |
| CV-003-VO (QC) / 040109201-0013 | 0 | 0 | 0 | 0 | 5 |

Notes:

1. These samples of soil/vermiculite did not generate any measurable (by weight) respirable dust for analysis when placed in the elutriator and such the subsequent analysis could not be performed. It is believed that these samples may have been subjected to a preparatory or processing procedure incorporating sieving. This may have resulted in size discrimination in these samples, leaving no particles <10µ.

2. Total asbestos structures represents all asbestos structures (fibers, bundles, cluster, and matrix) found during analysis. This includes six asbestos types-Chrysotile and Amphibole Asbestos (Amosite, Actinolite, Tremolite, Crocidolite, and Anthophyllite).

Notes(Continued)

3. Reported asbestos structures represent all asbestos structures that meet the reporting requirements based on size as stated in the EPA Superfund Method. These structures must be ≤0.5μ in diameter and ≥5μ in length.

4. Protocol asbestos structures represent all asbestos structures that meet the requirements of Notes 1 and 2 and are 5-10μ in length.

5. Long asbestos structures represent all asbestos structures that meet the requirements of Notes 1 and 2 and are >10μ in length.

6. Excluded asbestos structures represent all asbestos structures that meet the requirements of Note 1 but do not meet the size requirements of Notes 2-4.

7. Mineral Fibers of Concern represent a newer class of amphibole categories that has been identified by the USEPA Region 8 in conjunction with the Libby, MT project. These include richterite and winchite. The "Libby Amphiboles" are not currently classified as asbestos but those performing the risk assessment and exposure modeling from the sample results may take this mineral fiber data into consideration.

If you need any calculations based on the Libby Amphiboles identified in these samples, please let me know and I can create additional reports showing this data. If you have any questions or need further information please do not hesitate to contact me at 800-220-3675X 1209.

Sincerely,

Stephen Siegel, CIH
Asbestos Lab Manager

T-105

EMSL Analytical Inc.
107 Haddon Avenue
Westmont, NJ 08108
Contacts: Stephen Siegel, CIH, Scott Slavin, Ph.D
Phone:856-858-4800 Fax:856-858-4960

| | |
|---|---|
| Report Date | 7/25/2001 |
| Project Name | Region 4 Vermiculite |
| Methods | Draft Modified Elutriator Method for the Determination of Asbestos in Soils and Bulk Material Method (dated May 23, 2000, Revision 1) |
| EMSL Order ID | 040109201 |

| | |
|---|---|
| Date Started | 6/25/2001 |
| Date Completed | 7/24/2001 |
| Analyst | AS |
| Lab Sample# | 040109201-0005 |
| Field Subsample# | PV-123-VO |
| Field Preparation Technique | N/A |
| Sample Drying | Yes |
| Sample Splitting | N/A |
| Other | N/A |

**Tem Analysis**

| | |
|---|---|
| Effective Area of Analytical Filter (sq mm) | 385 (ME) |
| Magnification | 19,000 X |
| Grid Opening Area (sq mm) | 0.0061 |
| Number of Grid Openings Scanned | 10 |
| Asbestos Structure Size and Type Categories of Interest | Protocol Fiber<br>>5-10u Length<br><0.5u Diameter<br>Amphiboles/Chrysotile<br><br>Long Fiber<br>>10u Length<br><0.5u Diameter<br>Amphiboles/Chrysotile |
| Minimum Acceptable Structure Identification Category | 5u Length<br><0.5u Diameter |

**Dust Generator**

| | |
|---|---|
| Mass of Sample Tumbled(g) | 60.51 |
| Air Flow Rate Through ME opening of Dust Generator (ml/min) | 1430 |
| Air Flow Rate Through IST opening of Dust Generator (ml/min) | 72 |
| Estimated Total Air Flow Rate Through Elutriator (ml/min) | 1502 |

**Filters from the Isokinetic Sampling Tube(IST) opening of the Elutriator**

| | |
|---|---|
| Mass of Respirable Dust on Filter(g) | 0.000154 |

| | Number or Protocol Structures | |
|---|---|---|
| | Total | Long(>10um) |
| **Asbestos Analysis Results** | | |
| No of Chrysotile Asbestos Structures | 0 | 0 |
| No.of Amphibole Asbestos Structures | 0 | 0 |
| Amphibole Mineral Type(s) | | |

**ESTIMATED ASBESTOS CONCENTRATIONS (s/gPM10)**

| | Concentrations | |
|---|---|---|
| | Mean | 95% UCL |
| Total Chrysotile Protocol Structures | < 4.098E+07 | < 8.033E+07 |
| Long Chrysotile Protocol Structures | < 4.098E+07 | < 8.033E+07 |
| Total Amphibole Protocol Structures | < 4.098E+07 | < 8.033E+07 |
| Long Amphibole Protocol Structures | < 4.098E+07 | < 8.033E+07 |
| Long Asbestos Protocol Structures | < 4.098E+07 | < 8.033E+07 |
| Total Asbestos Protocol Structures | < 4.098E+07 | < 8.033E+07 |
| Estimated Analytical Sensitivity. (s/gPM10) | 4.098E+07 | 8.033E+07 |

7964

EMSL Analytical Inc.
107 Haddon Avenue
Westmont, NJ 08108
Contacts: Stephen Siegel, CIH, Scott Slavin, Ph.D
Phone:856-858-4800 Fax:856-858-4960

| | |
|---|---|
| Report Date | 7/25/2001 |
| Project Name | Region 4 Vermiculite |
| Methods | Draft Modified Elutriator Method for the Determination of Asbestos in Soils and Bulk Material Method (dated May 23, 2000, Revision 1) |
| EMSL Order ID | 040109201 |

| | |
|---|---|
| Date Started | 6/25/2001 |
| Date Completed | 7/24/2001 |
| Analyst | AS |
| Lab Sample# | 040109201-0001 |
| Field Subsample# | PV-004-VO |
| Field Preparation Technique | N/A |
| Sample Drying | Yes |
| Sample Splitting | N/A |
| Other | N/A |

**Tem Analysis**

| | |
|---|---|
| Effective Area of Analytical Filter (sq mm) | 385 (ME) |
| Magnification | 19,000 X |
| Grid Opening Area (sq mm) | 0.0061 |
| Number of Grid Openings Scanned | 0 |
| Asbestos Structure Size and Type Categories of Interest | Protocol Fiber<br>>5-10u Length<br><0.5u Diameter<br>Amphiboles/Chrysotile<br><br>Long Fiber<br>>10u Length<br><0.5u Diameter<br>Amphiboles/Chrysotile |
| Minimum Acceptable Structure Identification Category | 5u Length<br><0 5u Diameter |

**Dust Generator**

| | |
|---|---|
| Mass of Sample Tumbled(g) | 62.6 |
| Air Flow Rate Through ME opening of Dust Generator (ml/min) | 1430 |
| Air Flow Rate Through IST opening of Dust Generator (ml/min) | 72 |
| Estimated Total Air Flow Rate Through Elutriator (ml/min) | 1502 |

**Filters from the Isokinetic Sampling Tube(IST) opening of the Elutriator**

| | |
|---|---|
| Mass of Respirable Dust on Filter(g) | 0 |

| | Number or Protocol Structures | |
|---|---|---|
| | Total | Long(>10um) |
| **Asbestos Analysis Results** | | |
| No.of Chrysotile Asbestos Structures | 0 | 0 |
| No.of Amphibole Asbestos Structures | 0 | 0 |
| Amphibole Mineral Type(s) | | |

**ESTIMATED ASBESTOS CONCENTRATIONS (s/gPM10)**

| | Concentrations | |
|---|---|---|
| | Mean | 95% UCL |
| Total Chrysotile Protocol Structures | < #DIV/0! | < #DIV/0! |
| Long Chrysotile Protocol Structures | < #DIV/0! | < #DIV/0! |
| Total Amphibole Protocol Structures | < #DIV/0! | < #DIV/0! |
| Long Amphibole Protocol Structures | < #DIV/0! | < #DIV/0! |
| Long Asbestos Protocol Structures | < #DIV/0! | < #DIV/0! |
| Total Asbestos Protocol Structures | < #DIV/0! | < #DIV/0! |
| Estimated Analytical Sensitivity: (s/gPM10) | #DIV/0! | #DIV/0! |

7460

EMSL Analytical Inc.
107 Haddon Avenue
Westmont, NJ 08108
Contacts: Stephen Siegel, CIH, Scott Slavin, Ph.D
Phone:856-858-4800 Fax:856-858-4960

| | |
|---|---|
| Report Date | 7/25/2001 |
| Project Name | Region 4 Vermiculite |
| Methods | Draft Modified Elutriator Method for the Determination of Asbestos in Soils and Bulk Material Method (dated May 23, 2000, Revision 1) |
| EMSL Order ID | 040109201 |

| | |
|---|---|
| Date Started | 6/25/2001 |
| Date Completed | 7/24/2001 |
| Analyst | AS |
| Lab Sample# | 040109201-0002 |
| Field Subsample# | PV-005-VO |
| Field Preparation Technique | N/A |
| Sample Drying | Yes |
| Sample Splitting | N/A |
| Other | N/A |

**Tem Analysis**

| | |
|---|---|
| Effective Area of Analytical Filter (sq mm) | 385 (ME) |
| Magnification | 19,000 X |
| Grid Opening Area (sq mm) | 0.0061 |
| Number of Grid Openings Scanned | 0 |
| Asbestos Structure Size and Type Categories of Interest | Protocol Fiber<br>>5-10u Length<br><0.5u Diameter<br>Amphiboles/Chrysotile |
| | Long Fiber<br>>10u Length<br><0.5u Diameter<br>Amphiboles/Chrysotile |
| Minimum Acceptable Structure Identification Category | 5u Length<br><0.5u Diameter |

**Dust Generator**

| | |
|---|---|
| Mass of Sample Tumbled(g) | 58.91 |
| Air Flow Rate Through ME opening of Dust Generator (ml/min) | 1430 |
| Air Flow Rate Through IST opening of Dust Generator (ml/min) | 72 |
| Estimated Total Air Flow Rate Through Elutriator (ml/min) | 1502 |

**Filters from the Isokinetic Sampling Tube(IST) opening of the Elutriator**

| | |
|---|---|
| Mass of Respirable Dust on Filter(g) | 0 |

| | Number or Protocol Structures | |
|---|---|---|
| | Total | Long(>10um) |
| **Asbestos Analysis Results** | | |
| No.of Chrysotile Asbestos Structures | 0 | 0 |
| No.of Amphibole Asbestos Structures | 0 | 0 |
| Amphibole Mineral Type(s) | | |

**ESTIMATED ASBESTOS CONCENTRATIONS (s/gPM10)**

| | Concentrations | |
|---|---|---|
| | Mean | 95% UCL |
| Total Chrysotile Protocol Structures | < #DIV/0! | < #DIV/0! |
| Long Chrysotile Protocol Structures | < #DIV/0! | < #DIV/0! |
| Total Amphibole Protocol Structures | < #DIV/0! | < #DIV/0! |
| Long Amphibole Protocol Structures | < #DIV/0! | < #DIV/0! |
| Long Asbestos Protocol Structures | < #DIV/0! | < #DIV/0! |
| Total Asbestos Protocol Structures | < #DIV/0! | < #DIV/0! |
| Estimated Analytical Sensitivity (s/gPM10) | #DIV/0! | #DIV/0! |

7461

EMSL Analytical Inc.
107 Haddon Avenue
Westmont, NJ 08108
Contacts: Stephen Siegel, CIH, Scott Slavin, Ph.D
Phone:856-858-4800 Fax:856-858-4960

| | |
|---|---|
| Report Date | 7/25/2001 |
| Project Name | Region 4 Vermiculite |
| Methods | Draft Modified Elutriator Method for the Determination of Asbestos in Soils and Bulk Material Method (dated May 23, 2000, Revision 1) |
| EMSL Order ID | 040109201 |

| | |
|---|---|
| Date Started | 6/25/2001 |
| Date Completed | 7/24/2001 |
| Analyst | AS |
| Lab Sample# | 040109201-0003 |
| Field Subsample# | PV-006-VO |
| Field Preparation Technique | N/A |
| Sample Drying | Yes |
| Sample Splitting | N/A |
| Other | N/A |

**Tem Analysis**

| | |
|---|---|
| Effective Area of Analytical Filter (sq mm) | 385 (ME) |
| Magnification | 19,000 X |
| Grid Opening Area (sq mm) | 0.0061 |
| Number of Grid Openings Scanned | 10 |
| Asbestos Structure Size and Type Categories of Interest | Protocol Fiber<br>>5-10u Length<br><0.5u Diameter<br>Amphiboles/Chrysotile<br><br>Long Fiber<br>>10u Length<br><0.5u Diameter<br>Amphiboles/Chrysotile |
| Minimum Acceptable Structure Identification Category | 5u Length<br><0.5u Diameter |

**Dust Generator**

| | |
|---|---|
| Mass of Sample Tumbled(g) | 62.25 |
| Air Flow Rate Through ME opening of Dust Generator (ml/min) | 1430 |
| Air Flow Rate Through IST opening of Dust Generator (ml/min) | 72 |
| Estimated Total Air Flow Rate Through Elutriator (ml/min) | 1502 |

**Filters from the Isokinetic Sampling Tube(IST) opening of the Elutriator**

| | |
|---|---|
| Mass of Respirable Dust on Filter(g) | 0.000163 |

| | Number or Protocol Structures | |
|---|---|---|
| | Total | Long(>10um) |
| **Asbestos Analysis Results** | | |
| No of Chrysotile Asbestos Structures | 0 | 0 |
| No.of Amphibole Asbestos Structures | 0 | 0 |
| Amphibole Mineral Type(s) | | |

**ESTIMATED ASBESTOS CONCENTRATIONS (s/gPM10)**

| | Concentrations | |
|---|---|---|
| | Mean | 95% UCL |
| Total Chrysotile Protocol Structures | < 3.872E+07 | < 7.589E+07 |
| Long Chrysotile Protocol Structures | < 3.872E+07 | < 7.589E+07 |
| Total Amphibole Protocol Structures | < 3.872E+07 | < 7.589E+07 |
| Long Amphibole Protocol Structures | < 3.872E+07 | < 7.589E+07 |
| Long Asbestos Protocol Structures | < 3.872E+07 | < 7.589E+07 |
| Total Asbestos Protocol Structures | < 3.872E+07 | < 7.589E+07 |
| Estimated Analytical Sensitivity: (s/gPM10) | 3.872E+07 | 7.589E+07 |

7464

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Contacts: Stephen Siegel, CIH, Scott Slavin, Ph.D
Phone:856-858-4800 Fax:856-858-4960

| | |
|---|---|
| Report Date | 7/25/2001 |
| Project Name | Region 4 Vermiculite |
| Methods | Draft Modified Elutriator Method for the Determination of Asbestos in Soils and Bulk Material Method (dated May 23, 2000, Revision 1) |
| EMSL Order ID | 040109201 |

| | |
|---|---|
| Date Started | 6/25/2001 |
| Date Completed | 7/24/2001 |
| Analyst | AS |
| Lab Sample# | 040109201-0004 |
| Field Subsample# | PV-007-VO |
| Field Preparation Technique | N/A |
| Sample Drying | Yes |
| Sample Splitting | N/A |
| Other | N/A |

**Tem Analysis**

| | |
|---|---|
| Effective Area of Analytical Filter (sq mm) | 385 (ME) |
| Magnification | 19,000 X |
| Grid Opening Area (sq mm) | 0.0061 |
| Number of Grid Openings Scanned | 0 |
| Asbestos Structure Size and Type Categories of Interest | Protocol Fiber<br>>5-10u Length<br><0.5u Diameter<br>Amphiboles/Chrysotile<br><br>Long Fiber<br>>10u Length<br><0.5u Diameter<br>Amphiboles/Chrysotile |
| Minimum Acceptable Structure Identification Category | 5u Length<br><0.5u Diameter |

**Dust Generator**

| | |
|---|---|
| Mass of Sample Tumbled(g) | 6.32 |
| Air Flow Rate Through ME opening of Dust Generator (ml/min) | 1430 |
| Air Flow Rate Through IST opening of Dust Generator (ml/min) | 72 |
| Estimated Total Air Flow Rate Through Elutriator (ml/min) | 1502 |

**Filters from the Isokinetic Sampling Tube(IST) opening of the Elutriator**

| | |
|---|---|
| Mass of Respirable Dust on Filter(g) | 0 |

| | Number or Protocol Structures | |
|---|---|---|
| | Total | Long(>10um) |
| **Asbestos Analysis Results** | | |
| No.of Chrysotile Asbestos Structures | 0 | 0 |
| No.of Amphibole Asbestos Structures | 0 | 0 |
| Amphibole Mineral Type(s) | | |

**ESTIMATED ASBESTOS CONCENTRATIONS (s/gPM10)**

| | Concentrations | |
|---|---|---|
| | Mean | 95% UCL |
| Total Chrysotile Protocol Structures | < #DIV/0! | < #DIV/0! |
| Long Chrysotile Protocol Structures | < #DIV/0! | < #DIV/0! |
| Total Amphibole Protocol Structures | < #DIV/0! | < #DIV/0! |
| Long Amphibole Protocol Structures | < #DIV/0! | < #DIV/0! |
| Long Asbestos Protocol Structures | < #DIV/0! | < #DIV/0! |
| Total Asbestos Protocol Structures | < #DIV/0! | < #DIV/0! |
| Estimated Analytical Sensitivity. (s/gPM10) | #DIV/0! | #DIV/0! |